

# DESIGN and TECHNOLOGY CURRICULUM OVERVIEW



Design and Technology is a unique subject which develops a significant range of key transferable skills. The curriculum is offered from year 7 to 13 and has been designed to promote a healthy understanding of Design and Technology in its broadest sense. The subject offers pupils such a rich opportunity for creative development and independent learning, bringing together aspects of other subjects such as Maths, Physics and Art into a real life context.

Schemes of work ensure that there are diverse and challenging programmes of study for our pupils. Whilst working from realistic project briefs, pupils are encouraged to deeply consider the needs and desires of their target user group and how they can best fulfil these. Iterative design and reflection is central to our design philosophy. The advent of the Internet has opened up opportunities for pupils to conduct their own independent research. This can be particularly powerful when pupils work as a group and each makes their individual contribution to a collaborative project. It is essential that pupils have the opportunity to develop their own, unique designs and that they are inspired to develop these based on their research whilst drawing on rich sources of inspiration. Due consideration is given to communication skills, effective time management and project planning. An awareness of design being fit for purpose and an understanding of technology within society are also highlighted.

At Key Stage 3 teaching aims to introduce the principles of design and the design process. As the projects develop a range of experiences and are introduced to provide a background to support GCSE level project work. Experience of tools, materials, electronics and mechanisms are offered within the context of individual briefs. Each year is assigned a project which will run for the year and is subdivided into focussed tasks. This provides the opportunity to develop skills and detail necessary to access GCSE coursework.

The department is aware that not all students will continue to GCSE, despite our healthy uptake. The subject and choice of projects allows transferable skills to be developed which students will use in later studies and indeed their chosen career paths. The GCSE course continues to develop knowledge of materials, processes, creativity and sustainability. The pupils are encouraged to produce ideas of originality and value, to question and challenge, to envisage what could be. Equally, there is a focus upon having the opportunity to develop skills that will be vital for their career pathway.

Examples would be, further developing key skills of analysis, evaluation, project management and also developing a range of manipulative skills. As future professional designers they should be adept at considering sustainability issues. Good design is vital to our world and economy, and we hope that students following the D&T Product Design course will have a passion for designing their futures and will learn how to use their creativity to produce high quality products.

# KS3 DESIGN and TECHNOLOGY CURRICULUM



	Year 7	Year 8	Year 9
Autumn Term 1	<p><b><u>Board Game</u></b></p> <p>Course introduction, Folio style and setting the brief, Health &amp; safety, Analysis of the problem and consumer needs, Product analysis, Market research, Specifications</p>	<p><b><u>Sci fi vehicle for film the industry</u></b></p> <p>Folio style and setting Brief, Production of a storyline, Analysis of the problem, Product analysis, Gears and speed ratio research, Specifications</p>	<p><b><u>Portable speaker system</u></b></p> <p>Course introduction, Analysis of the problem and Consumer needs, Product analysis, Circuit Board research, Component research, Market research</p>
Autumn Term 2	<p>Generate initial ideas, Develop ideas, Manufacture of a board, Manufacturing processes/techniques, Tools and equipment</p>	<p>Generate initial ideas, Develop bodywork ideas, Design of chassis, Tools and equipment</p>	<p>Specifications, Machine tools and equipment, Manufacture of the circuit board, Initial ideas for the casing</p>
Spring Term 1	<p>Manufacture of pieces, Develop pieces and cards, Material properties and selection</p>	<p>Manufacture of Chassis, Manufacture of the gearbox frame</p>	<p>Development of casing, Modelling of casing, Final design of the casing</p>
Spring term 2	<p>Production of Instructions, Packaging design, Manufacture of packaging</p>	<p>Assembly of gearbox, Machine tools and equipment, Fitting gearboxes to the chassis and assembly of front axle, Vacuum forming the body mould</p>	<p>Casing manufacture, Front fascia manufacture via laser cutter, Timber cabinet using traditional joints</p>
Summer Term 1	<p>Advertising and marketing, “Dragon’s Den” presentation</p>	<p>Fitting bodywork to the chassis, Paint and decorate the body work, Design of control box, Soldering and assembly of the switch-gear, Construction of control box</p>	<p>Casing manufacture continued, Assembly and finish</p>
Summer Term 2	<p>Test and evaluate, modifications</p>	<p>Test and evaluate, modifications</p>	<p>Design and production of advertising, test and evaluate, modifications</p>

# KS4 DESIGN and TECHNOLOGY CURRICULUM



	Year 10	Year 11
Autumn Term 1	<p><b>Theory: Common core:</b> Introduction to the course. Emerging technologies and the environment. Energy generation and storage. The functions of mechanical devices, movement and forces. Electronic systems. Properties of ferrous and non-ferrous metals. Papers and boards.</p>	<p>NEA developing Ideas</p> <ul style="list-style-type: none"> <li>● Production of 4 initial ideas</li> <li>● Presentation techniques</li> <li>● Modelling and Use of CAD</li> <li>● Review of initial ideas and Client feedback</li> <li>● Development of final idea</li> </ul>
Autumn Term 2	<p><b>Theory: Common core:</b> Thermoforming and thermosetting polymers. Textiles. Timbers. Social and economic challenges. Investigate and analyse the work of past and present professionals and companies in order to inform design. Design strategies, avoiding fixation. <b>Design Activity: Plastics Forming: Production of a key ring using a range of processes including plastic memory. (Analysis and Research and Specifications)</b></p>	<p>NEA Final idea presentation</p> <ul style="list-style-type: none"> <li>● Review of concept and client discussion</li> <li>● Orthographic drawings</li> <li>● Materials selection and order of materials and cutting lists</li> <li>● Calculations of use of materials and costings</li> <li>● NEA Planning manufacture, quality control and safety factors</li> </ul>
Spring Term 1	<p><b>Theory: specialist Timbers:</b> Natural timbers, man-made boards and composite timbers. Sources and origins, characteristics, properties, social and ecological footprint. Genetic engineering, cost, cultural factors. Marketing and built in obsolescence.</p>	<p>NEA Manufacture</p> <ul style="list-style-type: none"> <li>● Making the product</li> <li>● Photo-diary of manufacture</li> <li>● Presentation of final outcome</li> </ul>
Spring Term 2	<p><b>Theory: Specialist Timbers:</b> Forces and stresses, Reinforcement/stiffening techniques, Frame structures, construction processes. Stock forms/types. Processes, scales of production, tools and processes.</p>	<p>NEA Testing and Evaluation</p> <ul style="list-style-type: none"> <li>● Test and client review</li> <li>● Evaluation and Modifications</li> <li>● Life-cycle assessment (<b>Submission of NEA</b> )</li> </ul>
Summer Term 1	<p><b>Theory: Specialist Timbers:</b> Fabricating/constructing, fixing methods, joints, adhesives and finishes. <b>Design activities: Timber forming: Laminated "Salad Servers" Timber joints: Cross halving Bridle and mortice and tenon joint cut as teams. Destructive testing to assess strength (Testing and Evaluation)</b></p>	<p>Exam preparation: review of common core and specialist subjects</p>
Summer Term 2	<p><b>Introduction to the Non Examined assessment</b> Introduction to the topic areas presented by the exam board. Analysing the problem. Conducting research leading to a brief. Generation of specifications</p>	

# KS5 DESIGN and TECHNOLOGY CURRICULUM



	Year 12		Year 13
Autumn Term 1	<p>Introduction to timbers, metals, polymers, paper and boards. Application of specialist measuring tools, accuracy and precision. Composites, manufactured boards. Polymers, thermosetting and thermoplastics, properties and processes. Casting processes. Textiles, papers and boards. Printing processes.</p> <p><b>Design Activities: Use of machine tools: lathe and Mill</b></p>		<p>NEA developing Ideas</p> <ul style="list-style-type: none"> <li>• Production of 4 initial ideas</li> <li>• Presentation techniques</li> <li>• Modelling and Use of CAD</li> <li>• Review of initial ideas and Client feedback</li> <li>• Development of final idea</li> </ul>
Autumn Term 2	<p>Design theory through the influences: Arts and crafts, Art Nouveau, Bauhaus modernism, Art Deco, Streamlining, Memphis, Post-modernism. Anthropometrics and ergonomics. Heat treatments of metals. Machine processes. Computer-aided manufacture. Safe working practices. Risk assessments. User centred design.</p> <p><b>Design Activities: Use of CAD CAM equipment and Production of an Arts and Crafts Clock</b></p>		<p>NEA Final idea presentation</p> <ul style="list-style-type: none"> <li>• Review of concept and client discussion</li> <li>• Orthographic drawings</li> <li>• Materials selection and order of materials</li> <li>• Material cutting lists</li> <li>• Calculations of use of materials and costings</li> <li>• NEA Planning manufacture, quality control and safety factors</li> <li>• NEA Making the product</li> </ul>
Spring Term 1	<p>Computer aided design. Performance characteristics and properties of materials. Permanent and semi-permanent joining techniques. Adhesives, joints and fixings. Welding, brazing and soldering. Material finishes.</p> <p><b>Design Activities: Production of an Arts and Crafts Clock Low temperature casting</b></p>		<p>NEA Manufacture</p> <ul style="list-style-type: none"> <li>• Making the product</li> <li>• Photo-diary of manufacture</li> <li>• Presentation of final outcome</li> </ul>
Spring Term 2	<p>Smart and modern materials. Marketing, innovation and feasibility studies.</p> <p><b>Design Activities: Thermoforming Techniques</b></p>		<p>NEA Testing and Evaluation</p> <ul style="list-style-type: none"> <li>• Test</li> <li>• client review, and Evaluation</li> <li>• Modifications and Life-cycle assessment (<b>Submission of NEA</b>)</li> </ul>
Summer Term 1	<p><b>Coursework Element.</b> Introduction to the Non Examined assessment. Analysing the problem. Conducting research, leading to a brief. Generation of specifications.</p>		Exam preparation: Review of theory for examination
Summer Term 2	Consolidating knowledge, enrichment and progression activities	Consolidating knowledge, enrichment and progression activities	